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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWN OF PENETANGUISHENE

COUNTY OF SIMCOE

1967

TOWN OF PENETANGUISHENE - 1967
(COUNTY OF SIMCOE)

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Report

on a

Water Pollution Survey

of the

TOWN OF PENETANGUISHENE

County of Simcoe

October 1967

District Engineers Branch

The Division of Sanitary Engineering

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

This is a report on a water pollution survey of the Town of Penetanguishene, the purpose of which was to locate and record any existing and potential sources of water pollution in the municipality. Where pollution sources are noted, recommendations concerning their abatement are made to the offending parties.

On June 27, and 28, 1967, samples were collected from the Penetang Harbour, Copeland Creek, and all of the known discharges to these waterways. The appendices contain the results of these samples, as well as an interpretation of the laboratory analyses.

HISTORY OF WATER POLLUTION CONTROL

The need for a water pollution control programme has been recognized for some time. A survey carried out by the OWRC in 1964 revealed that a large volume of polluted wastes was discharging from sewer and ditch outlets into Penetang Harbour. It was also noted that leachate from the municipal disposal area was reaching Copeland Creek and while the discharges from this site were not sufficient to impair the quality of the receiving water it was noted that such a discharge could result in water pollution. Approximately 35 per cent of the samples collected from the harbour 50-75 feet offshore, 35 per cent of the samples collected 150-175 feet offshore; and 25 per cent of the samples collected 400-500 feet offshore showed bacterial

contamination in excess of the OWRC permissible limits.

In 1966, sewage treatment for the municipality was realized by the construction of a water pollution control plant. The operation of these treatment works is discussed later in the report.

GENERAL

Location

The Town of Penetanguishene is located at the north end of Highway 27 on an inlet of Georgian Bay which is known as Penetang Harbour.

The town's population of approximately 5,000 increases considerably during the summer months.

Drainage

Drainage is provided mainly by the Penetang Harbour waterway and a small watercourse draining to it known as Copeland Creek. A small area at the south end of the town drains in an easterly and southerly direction.

Sewer System

A combined system of sanitary and storm relief sewers serving approximately 50 per cent of the municipality is in use. Originally these sewers discharged into the harbour, but with the construction of the water pollution control plant the main outfalls have been intercepted and directed to this facility.

Septic tank systems and a few privies serve as sewage disposal facilities for the remainder of the town.

WATER USES

Municipal Water Works

Water is supplied from two free-flowing artesian wells which discharge into a 250,000-gallon, covered concrete storage reservoir located close to the wells. From this reservoir water is pumped directly to the distribution system and to a 250,000-gallon ground-level reservoir which provides storage on the system.

The bacteriological quality of this supply has been generally satisfactory. Chemically, the water is hard, and at times reveals a slightly high iron content. Records kept over the past 2 years have indicated an approximate per capita consumption of 100 gallons per day.

The Ontario Hospital at Penetanguishene uses this water supply but maintains its own chlorination system since problems had been encountered with adverse bacteriological results in the hospital's distribution system.

Private and Industrial

Since the town is almost 100 per cent serviced by municipal water there are no major private or industrial water supplies.

Recreation

Bayfield Park located at the extreme north end of the town is a popular swimming area.

WATER POLLUTION

Water Pollution Control Plant

Secondary sewage treatment is provided by the municipal water

pollution control plant. Initially, the plant had been sized to treat an average flow of 400,000 (US) gallons per day; however, approximately twice this flow can be handled during storms before bypassing commences. Two more units will be added to the plant when required to give a total treatment capacity of 2,000,000 (US) gallons per day. The plant effluent is chlorinated and discharged through a submerged outfall to Penetang Harbour.

Samples have revealed a fairly weak raw sewage having a BOD of about 100 parts per million. With the exception of a period during the spring and early summer of this year, the plant has been giving generally satisfactory performance.

Private Sewage Disposal

Domestic sewage from the part of the town not served by the sewers is disposed of by means of individual septic tank systems and a very small number of outdoor privies. These areas generally are in the extreme east and west ends of the town.

The Simcoe County Health Unit has made surveys of the unsewered areas and found substantial numbers of private sewage disposal systems which are inadequate. Due to this, inadequately treated wastes can be observed in the ditches and drainage systems which ultimately drain to Penetang Harbour.

Storm Drainage System

The two main combined sewers, a 15-inch combined sewer opposite Owen Street, and a 24-inch combined sewer opposite Burke

Street, have been intercepted and connected to the water pollution control plant. The 48-inch storm relief sewer which discharges to the harbour west of Water Street remains. There was minimal flow in this sewer at the time of the survey. A sample collected from the manhole prior to discharge (Sampling Point PH 7-W) revealed a slightly high coliform count but otherwise satisfactory water quality.

As previously mentioned, the effluent from malfunctioning septic tank systems gains access to the storm drainage system. The presence of inadequately treated sewage discharging from the 36-inch concrete outfall at the foot of Scott Street (PH 6-W) is visually evident. The sample results also reveal high BOD and coliform counts. Contamination to a lesser degree is occurring from the storm outfall discharging to Copeland Creek, (Sampling Point C 0.55-W) and the storm sewer on Fox Street (Sampling Point PH 18-W).

The obvious solution to this problem is an extension of the sanitary sewer system to serve the unsewered areas. Apparently this is not feasible at the present time due to the financial position of the town ; however, every effort should be made to initiate such a programme at the earliest possible date.

Ontario Hospital Water Pollution Control Plant

Sewage treatment for the Ontario Hospital at Penetanguishene is accomplished by an activated sludge water pollution control plant. The design flow from this plant is 125,000 gallons, but due to infiltration during heavy rainfalls, hydraulic overloads have been

experienced. Because of this the plant efficiency has been below that expected and recommendations have been made to improve the situation.

Industry

There are no major sources of liquid industrial wastes in the municipality. Industries such as the local dairies and the bottling works direct their wastes to the sanitary sewer system.

Any new industries which settle in the municipality are required to connect to the sanitary sewers.

Refuse Disposal

The present refuse disposal site is located south of the town in the Township of Tiny. This site was developed fairly recently as a joint project of the Town of Penetanguishene, the Town of Midland, and the Township of Tiny.

From 1961 to 1966, a 5-acre site in a swampy area bordering Copeland Creek was used for municipal refuse disposal. This area has been completely covered with clean fill and municipal officials plan to develop it into a municipal park in the near future. There was evidence of leachate emanating from the site and flowing to Copeland Creek at the time of the survey. A sample of this material was collected and is recorded under Sampling Point C 0.5-D. BOD and suspended solids concentrations of 5.3 parts per million and 157 parts per million respectively were noted in the sample. An excessive coliform count (7,500 per 100 ml) was noted in the creek

opposite the site. In order to prevent its flow to the creek, it will be necessary to trench the perimeter of the site in order to direct the leachate to an area where it can be retained and ultimately disposed of in a satisfactory manner.

Waterfront Area

The waterfront area is used extensively for recreation. The amount of sanitary wastes which may be discharged to the water from boats having toilet facilities is not known. Regulations concerning control of the discharge of sewage from pleasure craft have been passed recently and will come into force in July 1968. The regulations specify approved types of devices which are to be used in the various watercraft and it is anticipated that as a result of these regulations, a network of pumping and shore disposal systems will be established at regular docking areas.

A public washroom is located near the Department of Transport Dock at the foot of Penetanguishene Road. Dye testing of these facilities did not indicate a direct discharge to the adjacent waters.

A lunch counter and an ice cream bar are also operated in this area. Disposal facilities for the ice cream bar consist of a septic tank and tile bed system which apparently has been approved by the Simcoe County Health Unit. The snack bar does not have toilet facilities; however, a small utensil-washing sink has a discharge pipe to the harbour. Minimal use is made of this sink since single service containers are used.

COMPARISON WITH PREVIOUS SURVEY

The 1964 survey indicated that 35 per cent of the samples collected between the shore and 175 feet offshore showed bacterial contamination in excess of the OWRC permissible limits. During this survey approximately 50 samples were collected in an area from just offshore to approximately 200 feet offshore. One sample showed a coliform count slightly in excess of the Commission objective of 2,400 coliforms per 100 mililitres. Therefore it would appear that the establishment of the water pollution control plant has been a large step forward in the initiation of an effective water pollution control programme. However, a considerable amount of inadequately treated waste continues to be discharged to Penetang Bay via the storm drainage system.

Although the dumping operation at the former sanitary landfill site has been terminated, the problem of leachate draining from the site to Copeland Creek still remains.

SUMMARY

The main problem affecting water quality in Penetanguishene is the limitation of the present sanitary sewer system, necessitating the continued use of private sewage disposal systems many of which are malfunctioning. This is resulting in the discharge of inadequately treated sewage to the storm drainage system. Varying degrees of pollution were noted in some storm drainage outlets.

Leachate from the landfill site opposite Copeland Creek is draining to this small watercourse. An excessive coliform count was noted in the sample collected opposite the landfill site in the creek.

The obvious answer to the pollution problem is the extension of the sanitary sewer system to serve the affected areas in the town. This is difficult at the present time due to the town's financial position.

RECOMMENDATIONS

1. A programme of sanitary sewer extension should be initiated at the earliest possible date.
2. Measures should be taken to prevent the discharge of leachate to Copeland Creek from the old sanitary landfill site.

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APPENDIX

SIGNIFICANCE OF LABORATORY ANALYSES

Bacteriological Examination

The membrane filter technique is employed to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres. The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. A membrane filter coliform count in excess of the desirable upper limit of 2,400 organisms is considered to render waters undesirable for bathing purposes.

The M.P.N. Index reported by Regional Health Laboratories on drinking water supplies as the "Most Probable Number" (M.P.N.) per 100 millilitres of sample is employed to determine the count of coliform bacteria present in water supplies.

Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm), and is an indication of the amount of oxygen required for the stabilization of decomposable organic matter in the water. The completion of the laboratory test requires 5 days, under the controlled incubation temperature of 20° Centigrade.

The Commission objective for surface-water quality is an upper limit of 4 ppm.

Solids

The value for total solids, expressed in parts per million (ppm), is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses in regard to surface-water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, depositions in streams and injury to the habitat of fish.

TOWN OF PENETANGUISHENE

RESULTS OF SAMPLES COLLECTED FROM PENETANG HARBOUR

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Solids</u>		<u>Diss. (ppm)</u>	<u>M.F. Coliform Count per 100 ML</u>
				<u>Total</u>	<u>Susp.</u>		
			<u>(ppm)</u>	<u>(ppm)</u>	<u>(ppm)</u>		
PHA-1	Harbour at Copeland Creek mouth.	June 27/67	1.5	194	13	181	60
PHB-1	Harbour at Copeland Creek 200' out.	June 27/67	1.3	150	4	146	920
PHA-2	Harbour between Centre and Scott streets.	June 27/67					32
PHB-2	Harbour between Centre and Scott sts. 200' out.	June 27/67					540
PHA-3	Harbour northwest of John Street.	June 27/67					50
PHB-3	Harbour northwest of John Street 200' out.	June 27/67					24
PHA-4	Harbour southwest of Scott Street.	June 27/67					80
PHB-4	Harbour southwest of Scott Street 200' out.	June 27/67					4
PHA-5	Harbour opposite Scott Street.	June 27/67					4

TABLE I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>M.F. Coliform Count per 100 ML</u>	<u>EST Flow</u>	<u>Comments</u>
PHB-5	Harbour opposite Scott St. 200' out.	June 27/67					60		
PHA-6	Harbour northeast of Dock ruins.	June 27/67					180		
PHB-6	Harbour northeast of Dock ruins 200' out.	June 27/67					68		
PH-6W	36" concrete outfall at foot of Scott St.	June 28/67	50.0	392	20	372	22,000,000	7 gpm	septic tank eff.
PHA-7	Harbour opposite former (Owen St.) sewer outlets.	June 27/67	3.3	174	7	167	530		
PHB-7	Harbour opposite former (Owen St.) sewer outlets 200' out.	June 27/67					60		
PHB-7W	New storm sewer south of STP.	June 28/67	2.0	440	31	409	10,100	low flow	sampled at manhole.
PHA-8	Opposite STP outfall.	June 28/67					36,000		
PHB-8	Opposite STP outfall 200' out.	June 28/67					24		

TABLE I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total</u> <u>(ppm)</u>	<u>Solids</u> <u>Susp.</u> <u>(ppm)</u>	<u>Diss.</u> <u>(ppm)</u>	<u>M.F. Coliform Count per 100 ML</u>
PHA-8(1)	Opposite STP outfall.	June 28/67					1,540
PHA-8(2)	Opposite STP outfall.	June 28/67					192
PHA-8(3)	Opposite STP outfall.	June 28/67					64
PHA-9	Opposite Boat Launching Ramp.	June 27/67					50
PHB-9	Opposite Boat Launching Ramp 200' out.	June 27/67					320
PHA-10	Southeast of Government Wharf.	June 27/67					8
PHB-10	Southeast of Government Wharf 200' out.	June 27/67					48
PHB-10X	Harbour opposite D.O.T. washrooms.	June 28/67	3.2	106	5	101	2,300
PHA-11	Northeast of Harbour opposite D.O.T. wash- rooms.	June 27/67	1.5	250	4	246	44
PHB-11	Northeast of Harbour 200' out.	June 27/67					36

TABLE I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>M.F.Coliform Count per 100 ML</u>
PHA-12	Opposite Grew Boat Works.	June 27/67					28
PHB-12	Opposite Grew Boat Works 200' out.	June 27/67					32
PHA-13	Harbour opposite sewer outlet (Burke St.)	June 27/67	1.5	168	4	164	428
PHB-13	Harbour opposite sewer outlet (Burke St.) 200' out.	June 27/67					32
PHA-14	Southwest of Norse Boat Works.	June 27/67					30
PHB-14	Southwest of Norse Boat Works 200' out.	June 27/67					30
PHA-15	Northeast of Norse Boat Works.	June 27/67					208
PHB-15	Northeast of Norse Boat Works 200' out.	June 27/67					92
PHA-16	Opposite G.Beck Co. Ltd.	June 27/67					68
PHB-16	Opposite G.Beck Co. Ltd. 200' out.	June 27/67					24

TABLE I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total</u> (ppm)	<u>Total Susp.</u> (ppm)	<u>Diss.</u> (ppm)	<u>M.F. Coliform Count per 100 ML</u>	<u>Comments</u>
PHA-17	Between Beck Co. and Brooks Stave Mill.	June 27/67					52	
PHB-17	Between Beck Co. and Brooks Stave Mill 200' out.	June 27/67					<4	
PHA-18	Opposite Brooks Mill.	June 27/67					32	
PHB-18	Opposite Brooks Mill 200' out.	June 27/67					<4	
PH-18W	Fox Street storm sewer outfall.	June 27/67	0.8	218	16	202	690,000	clear
PHA-19	Opposite Bay Moorings Cruise Club.	June 27/67					<4	
PHB-19	Opposite Bay Moorings Cruise Club 200' out.	June 27/67					<4	
PHA-20	Opposite Rowika Ind. Ltd.	June 27/67					60	
PHB-20	Opposite Rowika Ind. Ltd., 200' out.	June 27/67					20	
PHA-21	Opposite Huronia Park.	June 27/67					16	

TABLE I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Solids</u>		<u>Diss. (ppm)</u>	<u>M.F. Coliform Count per 100 ML</u>
				<u>Total</u>	<u>Susp.</u>		
				<u>(ppm)</u>	<u>(ppm)</u>		
PHB-21	Opposite Huronia Park 200' out.	June 27/67					4
PHA-23(1)	Opposite Bay Field Park.	June 27/67					56
PHA-23(2)	Opposite Bay Field Park.	June 27/67					44
PHA-23(3)	Opposite Bay Field Park.	June 27/67					60
PHB-23	Opposite Bay Field Park 200' out.	June 27/67					48

TOWN OF PENETANGUISHENE

RESULTS OF SAMPLES PERTAINING TO COPELAND CREEK

TABLE II

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>M.F. Coliform Count per 100 ML</u>	<u>EST Flow</u>
C 0.5	Copeland Creek opposite landfill site.	June 28/67	1.0	184	10	174	7,500	
C 0.5-D	Leachate from landfill site.	June 28/67	5.3	354	157	197		
C 0.5-W	Storm sewer outfall to Copeland Creek.	June 28/67	6.4	268	6	262	360,000	2-3 gpm

